

REMARKS

Claim Rejections

Rejections Under 35 U.S.C. 112

The Examiner has rejected claims 5 and 8 under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 5, the Examiner wrote:

Claim 5 lacks proper antecedent basis: "the available paths".

Claim 5 has been amended herein to delete the phrase that lacked proper antecedent basis. Applicant submits that claim 5 is now in compliance with 35 U.S.C. 112.

With respect to claim 8, the Examiner wrote:

The term "substantially" in claim 8 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. In other words, the term "substantially" renders the claim indefinite because the frequency with which data transfer requests is not clearly defined in the claim.

Claim 8 has been cancelled herein, rendering this rejection moot. Applicant submits that all claims pending after this amendment are now in compliance with 35 U.S.C. 112.

Rejections Under 35 U.S.C. 102 and 35 U.S.C. 103

The Examiner has rejected claims 1-7, 11, 14-19, and 22-27 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,257,386, with an inventor of Saito (hereinafter "Saito"). The Examiner has also rejected claims 8, 28 and 29 under 35 U.S.C. 103(a) as being unpatentable over Saito, in view of U.S. Patent No. 5,572,694, with an inventor of Uchino (hereinafter "Uchino"). The Examiner has also rejected

claims 9 and 10 under 35 U.S.C. 103(a) as being unpatentable over Saito, in view of U.S. Patent No. 7,093,086, with an inventor of van Rietschote (hereinafter "Van Rietschote"). The Examiner has also rejected claims 12 and 13 under 35 U.S.C. 103(a) as being unpatentable over Saito, in view of U.S. Patent No. 7,203,944, with inventors of van Rietschote et al. (hereinafter "Rietschote").

All of the pending claims have been cancelled herein, except for claims 1-7. Hence, all claim rejections, except those related to claims 1-7, as amended herein, are moot.

With respect to claim 1, the Examiner wrote:

As to claim 1, Saito discloses a method for responding to a request to transfer data between a virtual machine (VM) in a virtual computer system and a data storage unit within a multipath data storage system, the method comprising:

determining multipath routing information related to possible paths over which the data may be routed [column 3 «lines 46-63» | column 6 «lines 36-42» : determining whether paths are available];

determining VM-specific information related to the VM in the virtual computer system [column 3 «lines 51-56» : each VM has a transfer priority];

based on the multipath routing information and the VM-specific information, deciding whether to route the data transfer request [column 3 «line 67» to column 4 «line 14» | column 6 «lines 36-46» : decision on whether to route the request based on whether the path is available and the VM's transfer priority]; and

if a decision is made to route the data transfer request, then, based on the multipath routing information and the VM-specific information, selecting a path over which to route the data [column 6 «lines 47-56»].

Applicant has amended claim 1 to add the following limitations: (a) "determining that a failure has occurred that prevents the transfer of data over a first path of the plurality of possible paths" and (b) "in response to the determination that the failure has occurred that prevents the transfer of data over the first path, suspending the first VM." Applicant respectfully submits that none of the references cited by the Examiner, considered separately or in combination, discloses nor suggests suspending a VM in response to a determination that a failure has occurred that prevents the use of a data path. New claim 37, another independent claim, includes the same limitations.

Similarly, new claims 32 and 44, which are also independent claims, include the following limitations: (a) "determining that a failure has occurred that prevents the transfer of data over a first path of the plurality of possible paths" and (b) "in response to the determination that the failure has occurred that prevents the transfer of data over the first path, migrating the first VM to a different physical computer." Applicant respectfully submits that none of the references cited by the Examiner, considered separately or in combination, discloses nor suggests migrating a VM in response to a determination that a failure has occurred that prevents the use of a data path.

In connection with original claims 9 and 10, the Examiner acknowledges that "Saito does not expressly disclose indicating whether a failure is occurring on one of the paths over which the data could otherwise have been routed, and where the VM is temporarily suspended if a failover is occurring on one of the paths." Also in connection with original claims 9 and 10, however, the Examiner wrote that:

Van Rietschote discloses detecting a failure occurring on one of the paths, and where the VM is temporarily suspended if a failover occurs on one of the paths [column 1 «lines 13-25» | column 4 «lines 18-35» where: Van Rietschote detects whether a computer system on the network path has failed. The computer system failing is analogous to a failure occurring on one of the paths because the computer system is on the network path].

While Van Rietschote discloses the possibility of failures "in the storage chain between (and including) the storage device and the computer system (column 1, lines 20-25)," Van Rietschote does not disclose determining that such a failure has occurred, or determining that a failure has occurred that prevents the transfer of data over a data path. Also, while Van Rietschote discloses the possibility of suspending a VM, Van Rietschote does not disclose suspending a VM in response to a determination that a failure has occurred. Instead, Van Rietschote discloses supporting a command to suspend a VM (column 4, lines 18-19).

In connection with original claims 12 and 13, the Examiner wrote:

As to claims 12 and 13, Saito does not expressly disclose if a decision is made not to route the data transfer request, a further decision is made whether to suspend or migrate the VM. Rietschote remedies this deficiency. Rietschote is directed to balancing loads on computer systems that execute a

plurality of virtual machines [column 2 «lines 12-15»].

Rietschote expressly discloses either migrating or suspending a VM from a first computer system to a second computer system if the first is unable to handle the load from the VM [column 2 «lines 12-24» | column 6 «lines 12-16» | column 7 «lines 4-22»], based on several factors including whether or not the system can handle the I/O (data transfer) requests from the VM [column 5 «lines 4-16»].

Rietschote discloses the possibility of migrating a VM to a different computer system. However, Rietschote does not disclose migrating a VM in response to a determination that a failure has occurred. Instead, Rietschote discloses migrating a VM "responsive to a first load of the first computer system prior to the migration exceeding a second load of the second computer system prior to the migration (column 2, lines 20-24)." Rietschote also discloses the possibility of suspending a VM, but, again, Rietschote does not disclose suspending a VM in response to a determination that a failure has occurred. Rietschote does specifically disclose supporting a command to suspend a VM (column 7, lines 4-5).

Applicant submits that, as described above, claims 1, 32, 37 and 44 (all of the independent claims), as amended or added herein, include limitations that are not disclosed nor suggested by the prior art references cited by the Examiner. Accordingly, Applicant submits that all of the independent claims are patentable over the prior art of record. Each of the dependent claims includes all of the limitations of the independent claim from which it depends. Hence, Applicant submits that all of the dependent claims are patentable over the prior art of record for the same reasons as described above.

Conclusion

The various embodiments of the applicant's invention as defined in the various independent claims recite features that are not found at all in any of the cited references, whether the references are viewed independently or in combination. Accordingly, applicant submits that the independent claims are allowable over the cited prior art. The various dependent claims, of course, simply add additional limitations and should therefore be allowable along with their respective independent base claims. Applicant requests reconsideration of this application.

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Respectfully submitted,

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